

RESEARCH PROBLEM STATEMENT #DC-506

I – Problem Title

Evaluation of Wet Weather Accident Causation Criteria (RD-12)

II – Research Problem Statement

Existing tools for assessment of hydroplaning seem to vastly over predict the potential for such occurrences. No tools or data currently exist that correlate actual wet weather accident events with associated rainfall intensities (which directly affect water film thickness on pavements), roadway surface texture and roadway geometric conditions. It would be desirable to establish a method for capturing rainfall intensity data at specific locations and comparing the calculated hydroplaning conditions to actual accident rates.

III – Objective

Provide tools to designers to more accurately ascertain the possibility of hydroplaning occurrence.

IV – Background

The only computational tool currently available to designers is described in FHWA's Hydraulic Engineering Circular #21. Using the formula provided, and typical inputs, it would be expected for vehicles to experience hydroplaning on most roadways with more than three lanes of width that are sloped in the same direction under moderate rainfall events. As such, the only predictive tool would conclude that virtually every urban freeway in California has a high likelihood of experiencing, if not causing, hydroplaning related accidents. However, there does not seem to be a wet weather accident rate that supports the predictive model.

V – Statement of Urgency and Benefits

Caltrans faces significant tort liability for the possible design of facilities that might be questioned as a causative factor in vehicular accidents. It is extremely important for designers to have tools that are accurate predictors of real world performance, as opposed to the current models that are based on laboratory studies of wheel spin down.

VI – Related Research

Unknown

VII – Deployment Potential

Once completed, this information could be used directly to support design guidance in Chapter 800 of the Highway Design Manual